Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
       SEMICONDUCTOR DEVICE
Inventor: Shin et al.
App. No.: Unknown
Docket No.: 115003-003
Firm/Attorney: Bell, Boyd & Lloyd, LLC/B. Joe Kim
Telephone No.: (312) 807-4354

Fig.1A

Fig.1B

Fig.1C

Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
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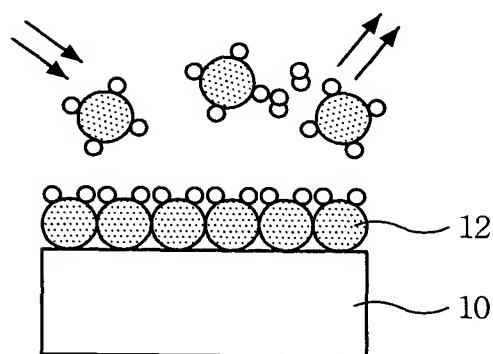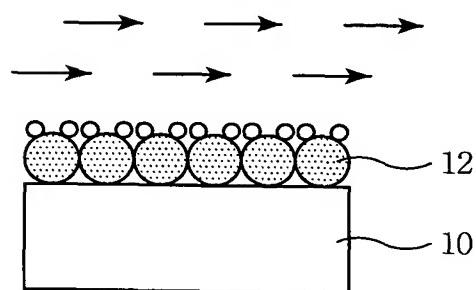Telephone No.: (312) 807-4354

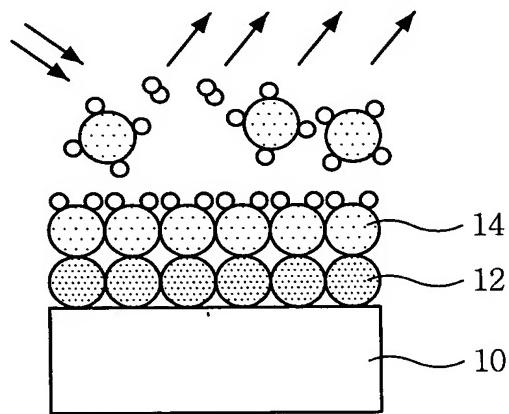Fig.1D

Fig.1E

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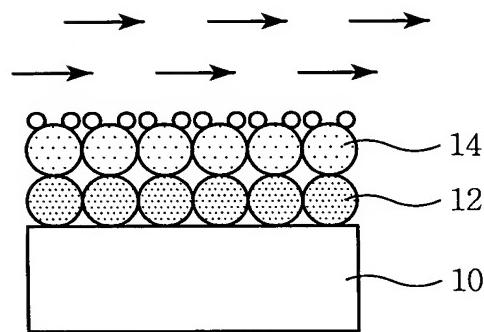
Fig.2

Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
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App. No.: Unknown
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Fig.3

Fig.4

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Firm/Attorney: Bell, Boyd & Lloyd, LLC/B. Joe Kim
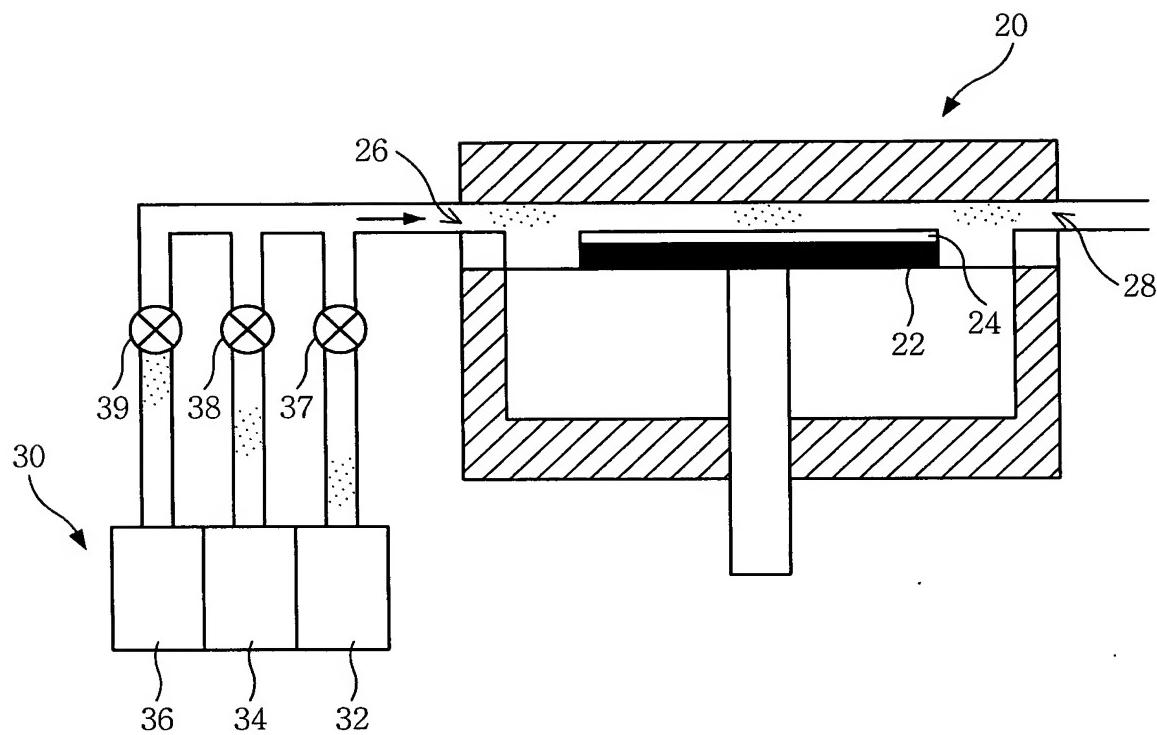Telephone No.: (312) 807-4354

120

122

124

Fig.5

Fig.6

Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
SEMICONDUCTOR DEVICE
Inventor: Shin et al.
App. No.: Unknown
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Firm/Attorney: Bell, Boyd & Lloyd, LLC/B. Joe Kim
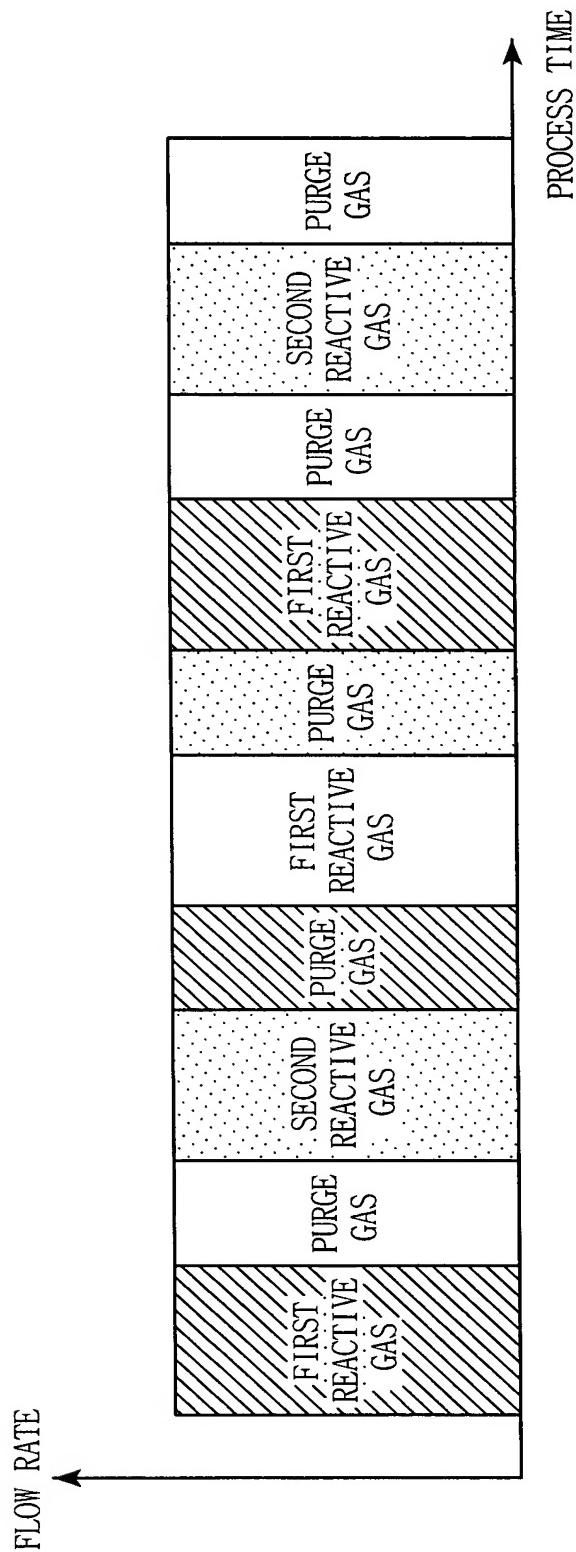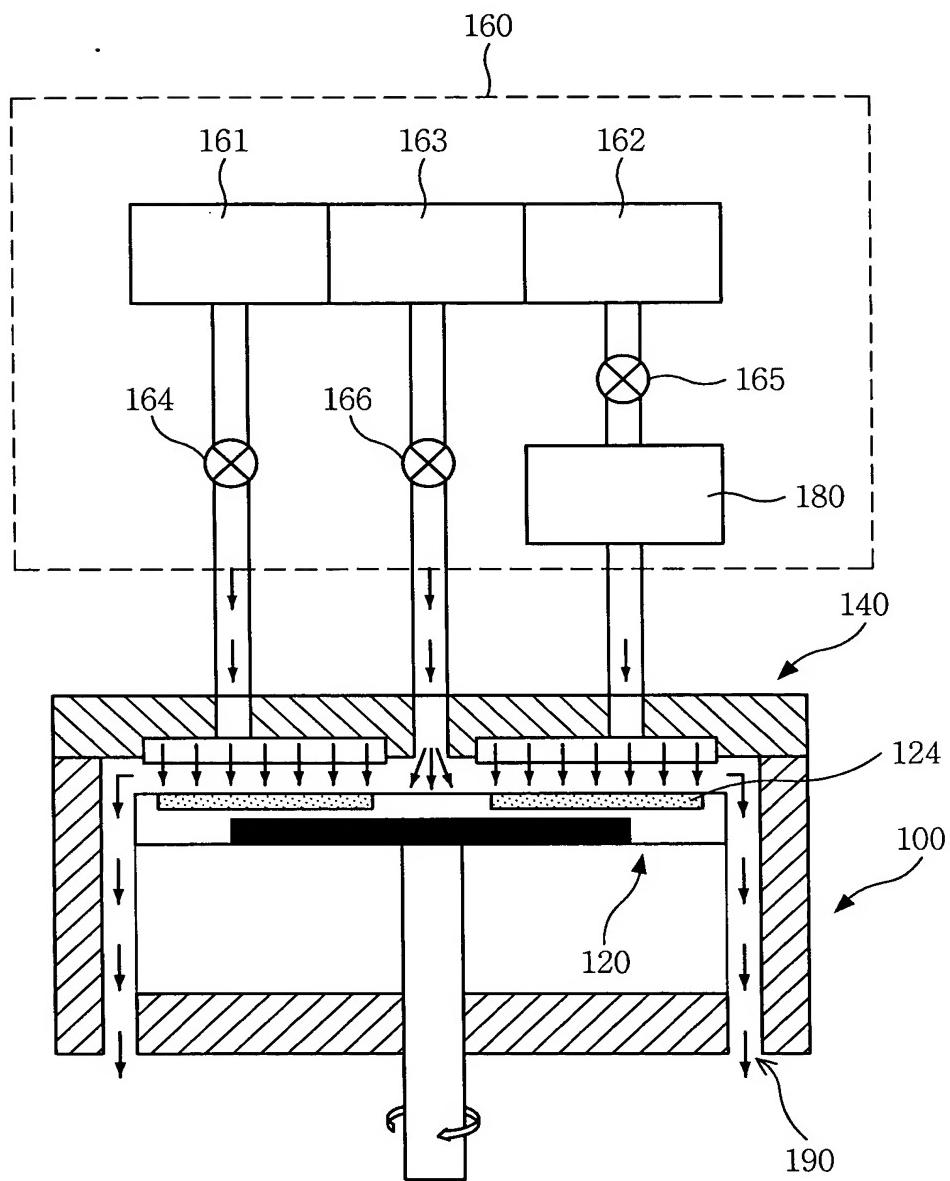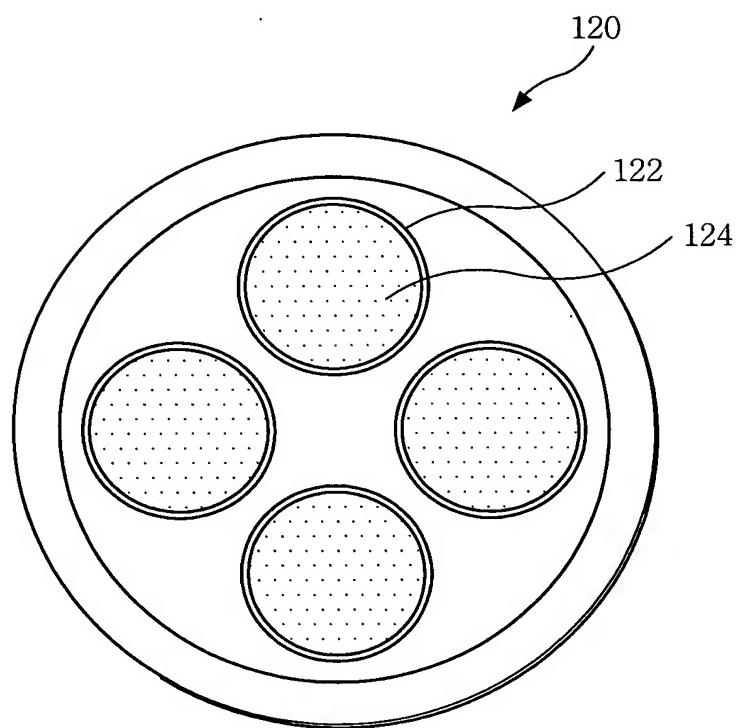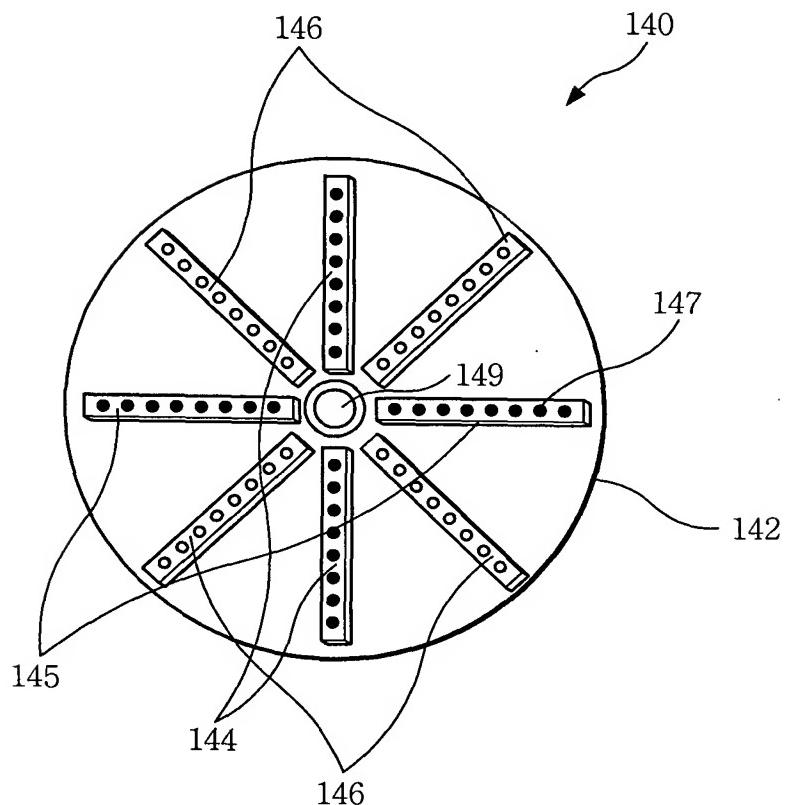Telephone No.: (312) 807-4354

Fig.7

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┌──────────────────────────────────────────────────────────┐
│              TRANSFER  WAFERS  INTO  REACTOR              │
└──────────────────────────────────────────────────────────┘
                            │
                            ▼
┌──────────────────────────────────────────────────────────┐
│   IN  ORDER  TO  DEPOSIT  UNIFORM  THIN  FILM  ON  WAFERS,│
│   1.  CONTROL  TEMPERATURE  IN  REACTOR                   │
│           INTO  PROCESSING  TEMPERATURE                   │
│   2.  MOVE  DISK  TO  OPTIMAL  POSITION  AND  ROTATE  DISK│
│   3.  CONTROL  PRESSURE  WITHIN  REACTOR                  │
└──────────────────────────────────────────────────────────┘
                            │
                            ▼
┌──────────────────────────────────────────────────────────┐
│   DEPOSIT  THIN  FILM  OF  ATOMIC  LAYER  ON  WAFERS      │
│   1.  SUPPLY  FIRST  REACTIVE  GAS                        │
│   2.  SUPPLY  SECOND  REACTIVE  GAS  EXCLTED  BY  PLASMA  │
│   3.  SUPPLY  INERT  GAS                                  │
└──────────────────────────────────────────────────────────┘
                            │
                            ▼
┌──────────────────────────────────────────────────────────┐
│              REMOVE  WAFERS  FROM  REACTOR               │
└──────────────────────────────────────────────────────────┘
```

Fig.8

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        SEMICONDUCTOR DEVICE
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Firm/Attorney: Bell, Boyd & Lloyd, LLC/B. Joe Kim
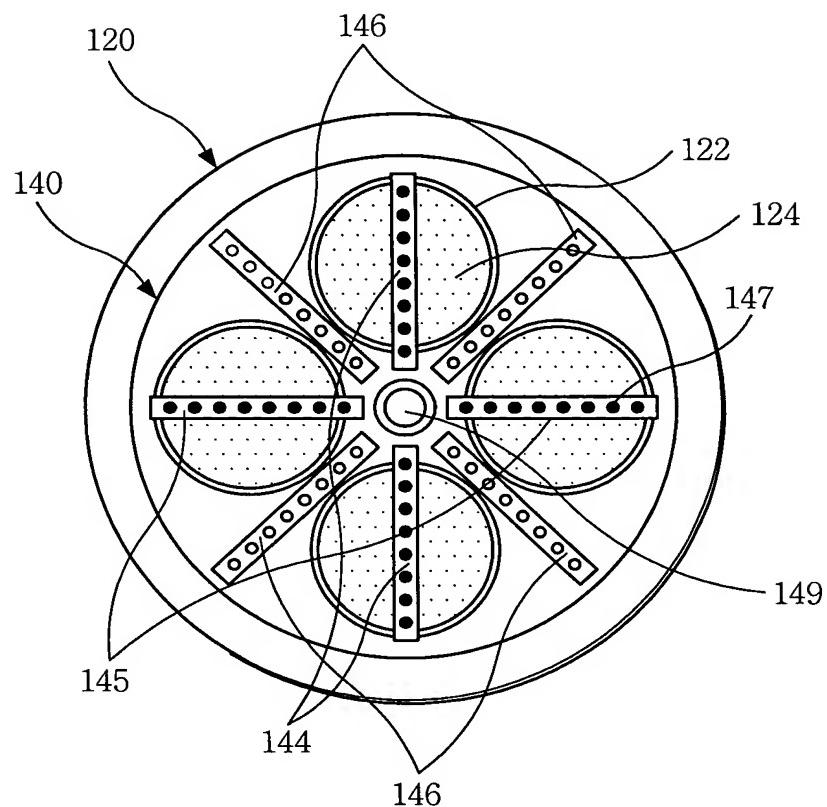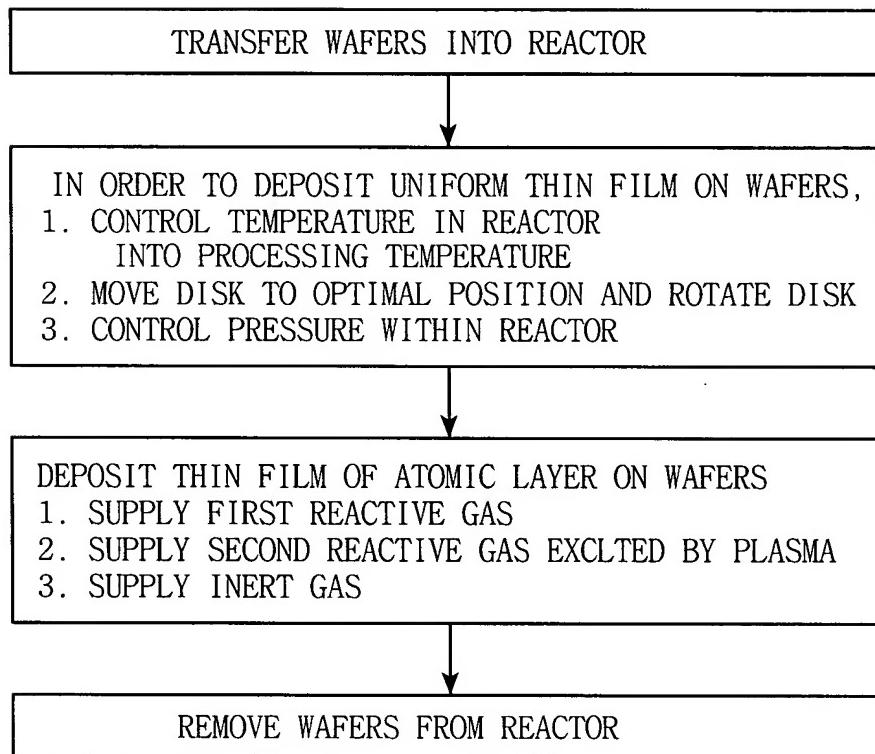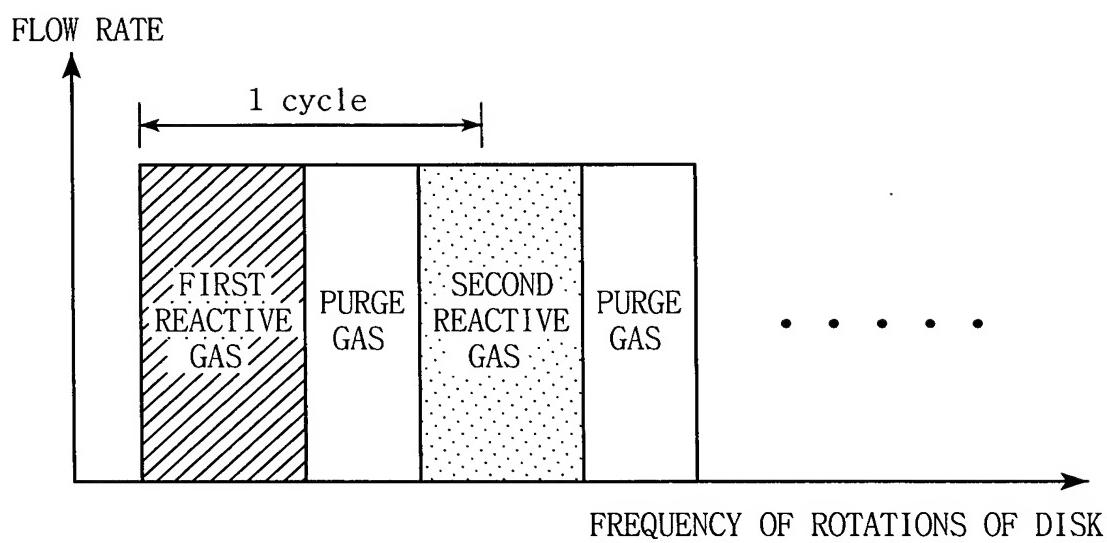Telephone No.: (312) 807-4354

FLOW RATE

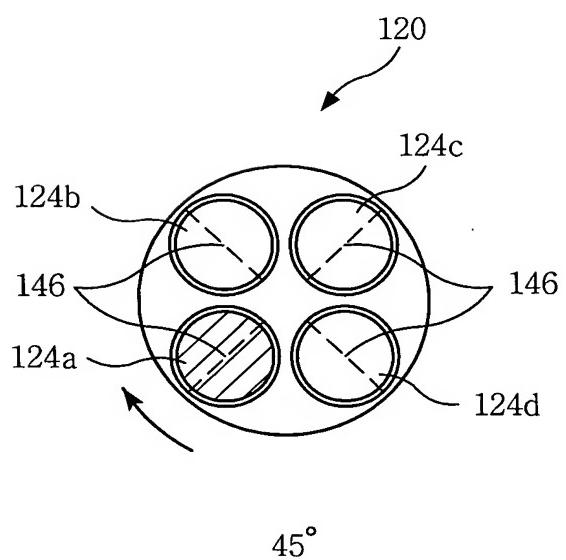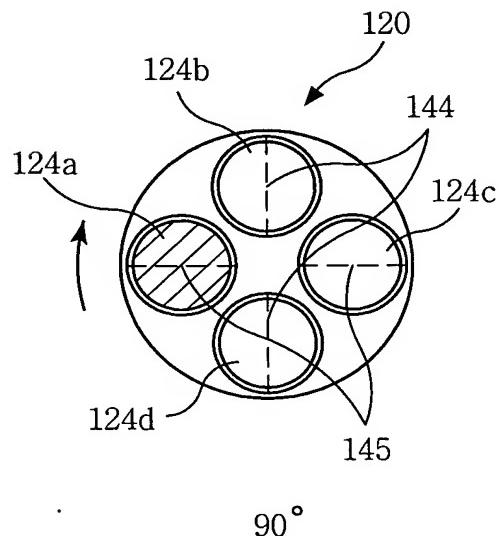FREQUENCY OF ROTATIONS OF DISK

Fig.9

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0°

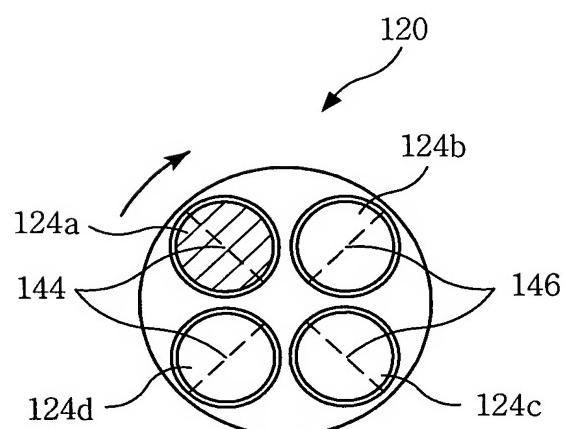Fig.10A

45°

Fig.10B

Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
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Inventor: Shin et al.
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90°

Fig.10C

135°

Fig.10D

Title: ALD APPARATUS AND ALD METHOD FOR MANUFACTURING
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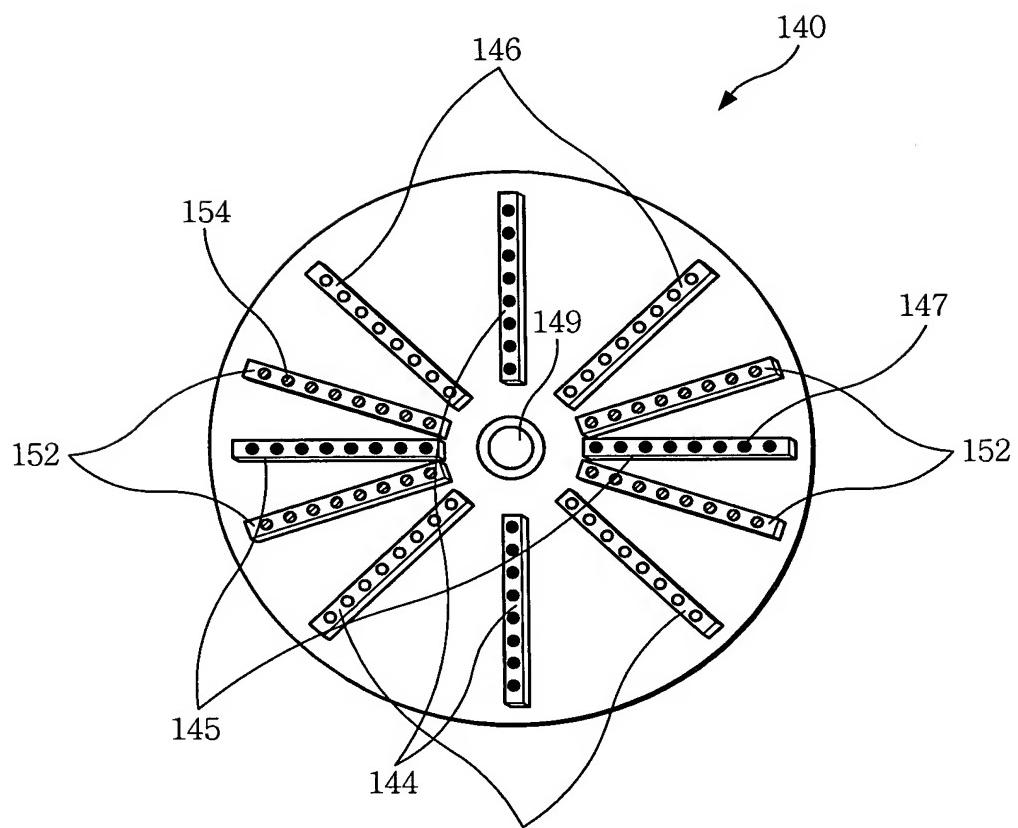Firm/Attorney: Bell, Boyd & Lloyd, LLC/B. Joe Kim
Telephone No.: (312) 807-4354

Fig.11

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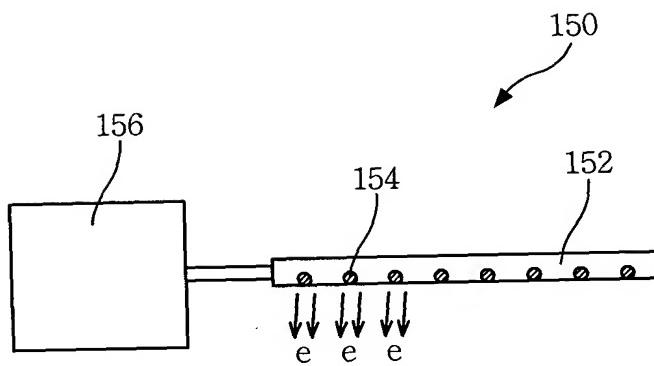Telephone No.: (312) 807-4354

Fig.12